

CALIFORNIA AND WESTERN MEDICINE

VOLUME XXVI

FEBRUARY, 1927

No. 2

THE OUTLOOK FOR THE DIABETIC

By ELLIOTT P. JOSLIN *

New England Deaconess Hospital, Boston

THE EDITOR: "*The Outlook for the Diabetic*," which begins below and will be completed in the March issue, is an address delivered by Dr. Elliott P. Joslin of Boston before the San Diego County Medical Society at the Scripps Metabolic Clinic, La Jolla, California, on November 18, 1926. Over two hundred physicians of southern California gathered to hear this address by an acknowledged authority on the subject.

THE Doctors' Diabetic Trust—The outlook for the diabetic depends upon the education of the public, the patient, and the medical profession. Diabetes is not like smallpox, diphtheria, or typhoid fever, which anybody can avoid if he so desires; it is not like malaria which a patient can cure with a few quinine pills, nor does it resemble a bone out of its socket which a deft surgeon can replace with a turn of the wrist. Diabetes is not yet so simple and never can be. Diabetes is a disease which is interwoven with the habits and heredity of the individual, and to prevent or combat it requires that the entire adult population of the country be lifted up to a higher level of medical knowledge. Fortunately to further this task the diabetic patients themselves are our agents and allies. The duty of the physician is to direct the program, but to my mind that is but a fraction of his task. I look upon the million diabetics in this country as a trust placed in the doctors' hands for conservation and development. The lives of the diabetics must be preserved, but they must yield dividends of health for all. These patients are under constant supervision. Here is the opportunity for health examinations on a vast scale. What other such select group of adult individuals exists which can demonstrate better the efficacy of preventive medicine, the success of prompt surgical intervention in acute and chronic surgical affections, including cancer, the effect of early diagnosis of tuberculosis and, in fact, all other medical ills which can be thwarted or cured. What a trust!

* Elliott P. Joslin (81 Bay State Road, Boston, Mass.). M. D. Harvard, 1895; B. A. Yale, 1890; Ph. D., Sheffield Scientific School (Yale), 1891; Hon. M. A., Yale, 1914. Graduate study: Massachusetts General Hospital; Boston Lying-In Hospital; Germany. Previous honors: Lieutenant-Colonel Medical Corps, United States Army. Present hospital connections: Consulting physician, Boston City Hospital; physician to New England Deaconess Hospital. Scientific organizations: American Academy of Arts and Sciences, Association American Physicians, A. M. A., American Philosophical Society, Interurban Club, American Society for Clinical Investigation. Present appointments: Clinical Professor of Medicine, Harvard Medical School. Practice limited to Medicine since 1895. Publications: "*The Treatment of Diabetes Mellitus*" (three editions). "*A Diabetic Manual*" (three editions), published by Messrs. Lea & Febiger, Philadelphia; "*Diabetic Metabolism with High and Low Diets*," Publication 323, Carnegie Institution of Washington, 1923.

The public and the patients too will watch our administration of it with critical eyes.

Education of the Public—The public should learn two facts about diabetes—first, that it is overwhelmingly more common after the age of 40 years, and, second, overwhelmingly more frequent in the fat.

The onset in 58 per cent of my cases in my former series was after the fortieth year, but in the group of patients who came under my observation for the twelve months ending July 1, 1926, the percentage of cases above 40 years was still greater, namely, 66 per cent. The death records for diabetes in Massachusetts as compiled by Angeline Hamblen are even more striking, for they show that for the years 1921-25, 86 per cent of the diabetic deaths were in individuals past 50 years of age as contrasted with 54 per cent in the first five years of the century. Middle life is a menace to the fat. When metabolism has become less active, when exercise lags and fat accumulates, the danger of acquiring diabetes becomes acute.

TABLE 1

THE FREQUENCY OF ONSET OF DIABETES
BY DECADES

The middle-aged obese furnish the material for diabetes. In 1921 the records of 1000¹ diabetics were examined and showed that the maximum weights of only 10 per cent were below the standard weight zone, while 15 per cent came in that zone, and 75 per cent were above it. If we limit our study to the 626 individuals in the table who were over 41 years of age there were but 5 per cent below standard weight, 10 per cent in that zone, and 85 per cent above it. Recently another compilation of 1000 cases has been made, but this time pains have been taken to exclude from the list all save true, proven, diabetics. Here the figures are even more conclusive, because they show that the maximum weights of only 2.5 per cent above the age of 41 were below the standard weight zone and over 86 per cent above it. Between the ages of 51 and 60 in this recent series there were 252 diabetics, and of this number there were but two individuals who were underweight. If the public does not wish diabetes it should learn to keep thin, or at least to avoid obesity.

TABLE 2

VARIATION FROM NORMAL, ETC.

Obesity is harmful quite apart from its predisposition to diabetes. In fact the duration of life of a group of my fat diabetics who in consequence lost

1. Joslin: Jour. Amer. Med. Assn., 1921, 76, 79.

TABLE 1
FREQUENCY OF ONSET OF DIABETES BY DECADES

Period	1	2	3	4	5	6	7	8	9
1898—1922 ¹	5.7	8.3	12.2	15.9	25.1	22.3	8.7	1.6	....
July 1925—July 1926 ²	5.1	7.8	6.7	12.4	24.8	27.6	13.4	2.0	0.2

¹ Compiled to July 1, 1922, 2611 cases; of these 2278 are true diabetics.

² Compiled July 1, 1925—July 1, 1926, 1135 cases; all true diabetics; ages of three others unknown.

weight has been shown to be greater than the calculated life expectancy for similar individuals without diabetes. Diabetes may be bad, but obesity in late middle life is worse.

Etna, California, shows the proper spirit. The Associated Press with its characteristic discrimination last June gave out a dispatch the importance of which was so obvious that the Boston *Herald* printed it on its front page. "Hill Town Hires Only Slim Teachers, Light on Muleback. Etna, Cal., June 11, 1926. Weight, or rather the lack of it, is one of the qualifications for teaching in the Salmon River School of northern California. On several occasions it has been the governing factor in the choice of a teacher. Applicants must give the figure at which they tip the scales, and too much avoirdupoise automatically stamps the application unsatisfactory." Praise be to Etna for her progressiveness.

The Education of the Diabetic—Personal responsibility for the treatment of his diabetes came with the general introduction of the use of the Benedict test for sugar by the patient. Many a patient had assumed this responsibility before, but it was not the least of Allen's contributions to medicine when he made the custom universal. Hitherto the patient not only could be cheated by the quack, but could cheat the doctor and himself too, but this simple test, which a child can perform, abolished any doubtful ideas in the patient's mind about the harmlessness of breaking his diet. The Benedict test has done more than anything else to secure for the physician the co-operation of his patient. Insulin has worked in a similar manner, because it has made the patient again co-operate with his doctor. Is there any chronic disease in which personal responsibility and co-operation between the two are more needed or better secured?

It is cruel to treat a diabetic patient without instructing him or her in regard to diet, insulin, and the complications which may arise in the disease and in a proper attitude toward work and life. One should go further and give suggestions about entering the professions, banking, and business, all of which are open. It would be disadvantageous to be a commercial traveler. The diabetic should not be a railroad engineer. Best of all he should seek an occupation which engages his muscles as well as his mind.

The development of the character of a patient, particularly if he is a child, demands almost as much attention as advice about diet or insulin. The pathos of the diabetic child years ago often led to relaxation in discipline, but today he should be treated

as any child. No longer is a diabetic, whether child or adult, to be considered as a different species. Neglect discipline and the results are disastrous to the peace of the family, and ultimately to the child's social contacts. A diabetic child should enjoy the memory of a deserved spanking when he grows up just as much as do the rest of us. Diabetic children are precocious. They are as superior mentally as Priscilla White has shown them to be superior in stature from the analysis of the heights of 100 of my diabetic children at onset of the disease. These 100 children exceeded the average of the Wood table by 2.7 inches.

Education of the Physician—The outlook for the diabetic in this generation as well as in the next depends upon the doctor of today. Diabetes demands him at his best. In its treatment he must combine knowledge acquired in the laboratory, clinical acumen, a statistical bent, and an eye to preventive medicine. Without the knowledge of laboratory technique he is lost in the differential diagnosis of coma. Without good clinical training he will miss a latent tuberculosis or a cancer. Without an interest in statistics it will be difficult for him to keep his records and derive cheer from the progress which his patients make. His future peace of mind depends on the assiduity with which he conducts a campaign for the prevention of complications in his diabetic patients and of diabetes years to come among their descendants and in his nondiabetic clientele as well.

The medical profession has made enormous strides in the treatment of diabetes. I will show that later, but I wish to suggest here certain lines in which further progress can be made. Those of us who are fortunate enough to have a multitude of assistants and technicians and beautiful laboratories at our command do not realize the difficulties and the doubts which the general practitioner encounters in the treatment of his diabetics. It is wonderful he does so well. But it is wrong for him to be denied or to go without simple quantitative tests for estimation of sugar in the urine and sugar in the blood, upon which his treatment must be based. He must keep in advance of the patient. If the patient knows the qualitative test for sugar, the doctor must know the quantitative test for sugar or how he can easily secure it. Fortunately today we have simple micro-methods for blood sugar which any high school girl under a doctor's direction can learn in a brief space of time, and then place at the disposal of the physician. All of us who work in hospitals co-operate in our laboratory work. Physicians outside of hospitals should co-operate as well. Every doctor

TABLE 2

VARIATION FROM NORMAL AT MAXIMUM WEIGHTS AT OR PRIOR TO ONSET, OF 1000 CASES OF DIABETES, CALCULATED FOR HEIGHT, AGE, AND SEX

Age, Years	Number of cases	Below standard weight, per cent			Normal Average Zone Percent $\pm 5-5$	Above standard weight per cent								Percentage of each decade below normal zone
		30-21	20-11	10-6		6-10	11-20	21-30	31-40	41-50	51-60	61-70	71+	
1-10.....	43	1	10	8	16	4	4	..	..	..	..	..	..	44
11-20.....	84	4	12	8	33	9	7	7	1	2	..	1	..	29
21-30.....	112	1	6	4	21	16	25	11	9	12	2	1	4	10
31-40.....	172	1	1	6	11	10	28	39	25	22	18	4	7	5
41-50.....	244	..	3	4	30	13	37	48	51	24	14	10	10	3
51-60.....	252	..	2	..	30	19	44	65	45	24	9	7	7	1
61-70.....	79	3	2	..	8	8	17	19	10	8	4	..	..	6
71-80.....	14	..	..	1	2	..	1	4	3	2	1	..	..	7
1-80.....	1000	10	36	31	151	79	163	193	144	94	48	23	28	

should have a laboratory at his elbow from which he can be furnished at minimum cost, or at no cost at all, the results of tests which will help him in his practice. It is more important for a hospital to teach a doctor in its neighborhood or perform for him the new, yet essential, laboratory tests than it is to do these tests for nothing upon a charity patient. I believe that the next forward step in the treatment of diabetes in the home—and that is where the majority of diabetics will always be treated—lies in making it easy for the general practitioner to have all the information that we in the hospital feel we must possess. Our hospital laboratories must be thrown open to the entire medical profession.

Diabetics seldom die of diabetes today. When they come for a visit to a doctor the doctor should never make it a routine, should never be content with an examination of the urine and a blood sugar test and a word about diet and weight, but he should look upon that patient as a trust, and insure him not only against the complications of diabetes, but against other diseases as well. No doctor should be just a diabetic specialist. The family doctor is the best doctor for a diabetic, because he is the one who can treat the patient from every angle. I believe that diabetic patients should be treated in their homes by the family physician, oftentimes in co-operation with another physician who sees more diabetics. I feel that if I can co-operate with a doctor in the treatment of one case of diabetes the chances are that that doctor will treat successfully ten other cases without me. I know I often fail of attainment of my purpose, because it is so easy for patients to come back to the office, but the intention is there, and I try to live up to it.

Indeed a diabetic in the family should be looked upon as an asset, a help to the health of all its members. He is the teacher of diet and cleanliness, a

force for hygiene. His family should become immune to diabetes. I try to teach my diabetics to lessen the dangers of diabetic heredity in their families by banishing obesity, to lessen arteriosclerosis, to avoid infections, and to live above the plane of tuberculosis.

Diabetics are Living, not Dying—Today it is the problem of the living diabetic rather than the dying. More than half of the diabetic children I have treated since 1898 are alive. During the year ending July, 1926, of the 185 living diabetic children on my rolls there were but five who died. Among 1138 true diabetics, old and new, who came for treatment last year there were but sixty deaths. In the year 1916 the percentage of deaths was 10 per cent, but this year the deaths were 5.3 per cent. It is noteworthy that no patient seen by me in the twelve months died at below the age of 15 years, and there were but three who were under the age of 30 years. Therefore in your future practice plan for the living diabetic.

Remember, too, that these modern diabetics will get married and rear families. With a diabetic boy this is allowable, but for a diabetic girl who contracts diabetes under 15 I have set a ten-year limit for the duration of the disease before entering upon matrimony. These girls need never, therefore, be over 25 years of age before marriage, and that is not too long to wait. Incidentally I will put on record that the catamenia of two of my patients returned after an absence of six years and six and a half years, respectively. Wilder has recorded a successful outcome of pregnancy in two severe cases of diabetes. I have seen the same. Following delivery both mother and child must be watched closely for hypoglycemia.

The Duration of Life of the Diabetic—In the Naunyn epoch the average duration of life of 331 of my fatal cases of diabetes was 4.8 years. The

TABLE 3
DURATION OF LIFE IN FATAL CASES OF DIABETES ARRANGED IN DECADES

Decades of onset, years	Before June, 1914		After June, 1914, to March 16, 1922		July 1, 1922— July 1, 1926	
	No. of cases	Duration years	No. of cases	Duration years	No. of cases	Duration years
0—9.....	25	1.2	47	2.7	16	2.7
10—19.....	39	2.9	69	3.3	48	2.9
20—39.....	80	3.9	162	5.3	114	6.9
40—59.....	137	6.9	216	8.1	344	8.4
60—89.....	50	4.5	103	6.1	134 ¹	5.4
0—89.....	331	4.8	597	6.0	656	7.0

1. One case duration unknown, making total deaths 657.

Allen epoch—and we recognize that F. M. Allen was given to the diabetics by California—raised this figure for 597 fatals to six years. Thus far in the Banting epoch there have been 652 fatal cases, and the duration of these averages seven years. The data are recorded in Table 3.

TABLE 3

The average increase in duration of life of the diabetic today over that of the Naunyn era is 2.2 years, or 45 per cent. But this does not represent the true change in longevity, because it is the old, not the young, diabetic who is dying. The proportionate number of deaths in the early decades has greatly decreased. In the Naunyn epoch the deaths of those with onset in the first decade constituted 7.5 per cent of the total number; in the present epoch they constitute only 2.5 per cent. In the Naunyn epoch the deaths of those with onset at over 40 years were 57 per cent, they are now 73 per cent. The average age of the sixty patients who died from among the 1138 patients I saw during the year ending July 1, 1926, was 59 years. This is ten years above the average age at death of the citizen of Massachusetts and a year above that of the expectation of life of the new-born child.

A better idea of the future duration of diabetics is shown by the living children. Among 395 cases there are 8 or 2.0 per cent, three dead and five living, who have suffered diabetes more than a decade and no doubt exists about the accuracy of the diagnosis of six of these cases. The statement, therefore, is justified that with children even with old methods there were between 1 and 2 per cent who lived more than ten years. It so happens that this is about half the percentage of adults who have lived over twenty years, namely, 142 cases in the first 4257 true diabetics (see Table 6) coming to me for treatment. But the increase in duration of life of the child is progressing far more rapidly than in the adult. Diabetes begins so late in life that it is clear the old conceptions of its relations will be reversed. Today the young diabetic will be the long-lived diabetic, and the old diabetic will have the shorter duration.

I have purposely dwelt long upon the increasing

duration of life of the diabetic because of the relation it bears to the outlook for the diabetics in general. They are playing a larger part in the life of the community than formerly. This is not because the number of individuals who develop the disease is growing, but simply because those who have it live longer. This is very well shown in a table compiled by Angeline Hamblen for the adjusted death rate for diabetes in Massachusetts and in the registration states.

TABLE 4
ADJUSTED DEATH RATE FOR DIABETES IN
MASSACHUSETTS AND IN THE
REGISTRATION STATES

Year	Registration States	Massachusetts
1900.....	10.4	11.1
1910.....	14.9	18.0
1920.....	15.9	18.4

There was a sharp increase in diabetes between 1900 and 1910, namely, from 11.1 to 18 per 100,000, but by 1920 the incidence had hardly changed. On the other hand, the true number of living diabetics must be far greater today. Whether there were 500,000 or a 1,000,000 diabetics in the United States in 1914 I do not know, but if the former figure was correct there must be over 700,000 now, and if the latter figure was nearer right there would be 1,400,000 now. The diabetic problem is therefore a real one and demands increasing thought. It will require many readjustments in our methods of life.

The Change in the Causes of Death in Diabetics—The causes of death in diabetes must exert a strong influence upon our attitude toward the outlook for the diabetic. A glance at Table 5 will show the extraordinary metamorphosis which the disease has undergone in this respect. In the Naunyn epoch 66 per cent of my fatal cases died of coma, and 87 per cent of all the diabetics whom the disease destroyed during its first year died of coma, and all the children died of coma; as late as 1922, 51 per cent of all cases died of coma; between 1922 and July 1, 1925, 28 per cent. Contrast these figures with the 10 per cent mortality due to coma this

TABLE 5
CAUSES OF DEATH

	1898— March 16, 1922		March 16, 1922— July 1, 1926		July 1, 1925— July 1, 1926	
	Cases	Percent	Cases	Percent	Cases	Percent
a. Coma Present	454	51	166	28	6	10
b. Coma Absent	433	49	431	72	54	90
1. Cardio-renal, vascular.....	155	17	183	31	22	37
2. Infections.....	141	16	128	21.5	15	25
3. Tuberculosis.....	51	6	30	5	2	3
4. Cancer.....	35	4	31	5	6	10
5. Inanition.....	21	2	3	5	0	0
6. Miscellaneous.....	30	3	44	7.0	9	15
7. Diabetes.....	...	..	12	2	...	..

last year. There were sixty diabetic deaths and among these 1138 cases coma picked just six victims. Picture to yourself these diabetic patients whom I chanced to see but one or more times, who later were wandering up and down the length and breadth of this land and in other countries and continents too, and yet the medical profession and the patients were so intelligent that only six individuals died from this cause. I consider these figures as high a tribute to the progressive ideas and open-mindedness for new methods of treatment by the medical profession as one can adduce. Insulin alone never brings a patient out of coma. Intelligence in its use must go hand in hand with it.

TABLE 5

The significance of this great change in the causes of death in diabetes is more fundamental than the mere recital of the figures implies. Not only is diabetes *per se* no longer as fatal as formerly, but hardly can be considered fatal at all. It is not the disease directly which kills the patient, but its complications. Diabetes has had bad companions and they have given her a bad reputation. But in another way the altered character of deaths is even more significant. Formerly when coma developed we doctors put the blame on the patient, but now the causes of death are of such a character that the patient will be placing the blame upon us.

Next to coma come cardiorenal and vascular diseases, the degenerative diseases of old age. Such causes of death might be anticipated because the average age of death of my patients last year was 59 years, and already your attention has been directed to Miss Hamblen's statistics, which show that 86 per cent of the deaths from diabetes in Massachusetts occurred after the age of 51. As coma has gradually decreased, so these diseases have gradually increased. Cardiorenal and vascular diseases seem almost hopeless to attack, but I am not so skeptical, now that insulin allows the increase of carbohydrate and the decrease of fat in the diet.

Infections caused fifteen deaths, 25 per cent, among the patients who died last year. This was the highest percentage of deaths from infections yet reached in any tabulation of my deaths. The major proportion of these were preventable, because due to local, not general, infections. These found entrance through the skin and resulted in abscesses, carbuncles, and more especially the infections associated with gangrene. Will not our patients expect us to teach them how they can escape such needless deaths?

Tuberculosis caused but two deaths, 3 per cent. Cancer was as fatal to my diabetics last year as coma, for there were six cases of each. It has increased as a cause from 4 per cent prior to 1922 to 10 per cent today, thus exhibiting plainly the trend of the diabetic to grow old.

Inanition disappeared as a cause of death, and the other causes were of most miscellaneous character and were such as might occur with any group of patients.

Diabetic patients frequently die in hospitals, and this is quite as it should be. One-sixth of all the diabetics who die in Boston die at the Deaconess Hospital. We are glad to receive the critical diabetic. The ordinary diabetic should be treated in the home. It is quite proper that the serious diabetic or the apparently hopeless diabetic should be sent to the hospital. There is a pleasure in fighting the disease in such patients and a great reward, because so many who have been thought utterly helpless recover. We have a rule at the Deaconess Hospital that diabetic coma and diabetic gangrene are just as much emergencies as a fulminating appendicitis or a ruptured duodenal ulcer, and when these patients arrive at the hospital treatment is carried out with the same earnestness and despatch as with these avowed emergencies. Last year, of the sixty deaths twenty-six occurred in the hospital, and in the last three years and a half the total deaths in the hospital from diabetes have reached sixty-five. Of

these twenty-eight were medical and thirty-seven surgical. Of the medical patients admitted 1.6 per cent died; of the surgical diabetics the mortality was 10 per cent, six times as great. Moral: The surgical diabetic demands six times the attention given to the medical diabetic and more, for he demands the attention of the physician as well as the surgeon. In passing I might add that the number of diabetics being operated upon is rapidly increasing.

Autopsies Upon Diabetics—Shields Warren is reporting autopsies upon eight of my diabetic children either by himself or various pathologists during the last twenty-five years and, in addition, Dr. John of Cleveland and Doctors Stansfield and Starrow of Worcester have contributed two other cases to the list. These are instructive. In no instance do they show the pancreas to be exhausted, much less the islands. Hyalin degeneration, common in the pancreas of the old diabetic, was absent and lymphocytic infiltration, rare in the pancreas of the old, was invariably present. Hydropic degeneration was disclosed in but a single case. The changes in the gland did not appear irreversible and for these to take place time appeared to be a large factor. I mention the paper chiefly because I believe the field for morphological studies upon the diabetic pancreas has been by no means exhausted and that we clinicians should secure for our pathologists more such opportunities for research. No report of a diabetic fatality today is of great significance without a statement of the postmortem examination.

How should our patients regard an autopsy? It should be looked upon simply as an operation. Statistics suggest that every other diabetic goes to the surgeon during the course of his disease. If every other diabetic must be operated upon before he dies I believe that every diabetic should be operated upon after he dies. An operation during life is attended with pain and is for the benefit of the individual. An operation after death is without pain, but for the good of humanity.

Such examinations should be performed within three hours after the death of the patient. A few thin sections of the pancreas one-fourth inch wide should be taken from the head, tail, and body of the gland and placed in a preserving fluid (Zenker's fluid is the best), but if unavailable a 10 per cent solution of formaldehyde could be substituted, or one could use 95 per cent alcohol.

(To be continued in the March issue)

Rip Van Winkle, the nickname given to the armored dinosaur which has recently been placed on exhibition in the London Museum of Natural History, was a vegetarian, according to the label attached by naturalists to its glass case, says the *New York Times*. Thus it has taken thirty million years to explode the myth that the animal was a murderous monster and terror to such men as Mr. Neanderthal and M. Cromagnon, the most famous of the prehistoric people. According to the naturalists a tiny disease-carrying flea, which occupies a case adjoining that of the dinosaur, was a far deadlier creature.—*M. J. and Record*.

Those Busy Bees—The Charity Organization Society, New York City, has records on 3300 social welfare agencies which have sought public support in the city or upstate. Of this number 1450 are active at the present time.—*Health News*, New York State Department of Health.

A SURVEY OF PRENATAL CARE IN CALIFORNIA *

By ADELAIDE BROWN, M. D.

Member California State Board of Health

ACCUMULATING facts from which any deductions can be drawn on the medical procedures of individual physicians is treading on delicate ground.

It is necessary to rely on questionnaires, and unless the woman answering a prenatal questionnaire is quite intelligent her answers may be misleading. Our first survey of 144 cases for prenatal care, babies under 6 months of age, was made in San Francisco in 1922. The answers were taken by two trained nurses, and the questions carefully explained—that is, as to pelvic measurements and blood pressure. In no case was the name of the doctor or hospital included.

In the second group studied, in July, 1925, 146 cases were surveyed. These mothers had babies under 6 months of age, thus in no way overlapping the first group. The answers were written down by an intelligent laywoman, who had for illustration a pelvimeter and a blood pressure apparatus. These were San Francisco cases, and the groups were both from the Children's Health Center of the American Association of University Women and the Emporium Baby Center of the San Francisco Board of Health. Both places attract an intelligent group of young mothers, the wives of clerks, street railway employees, postmen, mechanics, etc. They are a rather uniform group.

In the third group, numbering 129, surveyed in 1926, the questionnaire was answered by mothers with babies under 6 months, the births not under the same doctor, in most cases. The answers were written down by the nurse taking the record. They cover twelve counties, six in the northern and six in the southern part of the state, sixty-five mothers in one group and sixty-four in the other. We avoided towns of any considerable size, desiring to get the average of prenatal care throughout the state. The points brought out are tabulated as follows: In general these cases were confined by private physicians; out of 417 cases only three were delivered by midwives. For the purpose of comparison, we have charted the 1922 and 1925 cases from San Francisco as urban cases, and the 1925 cases from the state at large as rural cases.

CHART 1

Urban			Rural
1922	1925		1925
34	7	Home deliveries	88
110	139	Hospital deliveries	44
144	146	Total	129
112	127	Private doctor	118
30	19	Staff doctor	10
1	0	Midwife	1
143	146	Total	129

* Read before the San Francisco County Medical Society, August, 1926.